

## Patent Claims

### 1. Sensor arrangement, comprising:

- at least two sample chambers;
- at least two potentiometric FET-sensors, preferably ISFET-sensors or ChemFET-sensors, having, in each case, a sensitive surface section, wherein each sensitive surface section lies in flow connection with its one of the sample chambers; and
- a reference cell having a reference medium for providing a reference potential, wherein the sample chambers are connected with the reference medium via an electrolyte bridge.

2. Sensor arrangement as claimed in claim 1, wherein the sensor arrangement comprises a first module, which contains the sample chambers.

3. Sensor arrangement as claimed in claim 2, wherein the sensor arrangement comprises at least a second module, which has a plurality of potentiometric FET-sensors.

4. Sensor arrangement as claimed in claim 2, wherein the sensor arrangement comprises a plurality of second modules, each of which has a potentiometric FET-sensor.

5. Sensor arrangement as claimed in one of the claims 2 to 4, wherein the first module comprises a plate-shaped platform with bores, which serve as sample chambers.

6. Sensor arrangement as claimed in claim 5, wherein the bores traverse the platform, and wherein the at least a second module, or the second modules, are embodied as floor elements, which close the traversing bores from the underside of the first module.

7. Sensor arrangement as claimed in claim 5, wherein the potentiometric FET-sensors are integrated into the second module in such a manner that, in each case, a FET-sensor aligns with its one of the traversing bores.
8. Sensor arrangement as claimed in one of the preceding claims, wherein the electrolyte bridge extends via electrolyte canals, which are formed in the platform.
9. Sensor arrangement as claimed in claim 8, wherein the platform comprises a plurality of elements, preferably a plurality of layers, and the electrolyte canals are located in an interface between two neighboring elements.
10. Sensor arrangement as claimed in one of the claims 1 to 7, wherein the electrolyte bridge extends via electrolyte canals which are integrated in the second module.
11. Sensor arrangement as claimed in one of the claims 1 to 10, wherein the reference cell has a potentiometric reference-FET-sensor for providing a pseudo-reference-potential, which is registered against the reference-potential of a reference electrode.
12. Sensor arrangement as claimed in claim 11, wherein the reference electrode is contacted with the reference medium in the reference cell.
13. Sensor arrangement as claimed in claim 12, wherein the potentials  $U_{\text{diff}1}$ ,  $U_{\text{diff}2}$ , ...  $U_{\text{diff}N}$  of N FET-sensors in the sample chambers are determined against the pseudo-reference-potential, and the measured-variable-relevant, potential differences are, in each case, determined by difference formation between the pertinent potential and the reference potential - thus, in the case of pH, according to the formulas  $U_{\text{pH}1...N} = U_{\text{diff}1...N} - U_{\text{diffref}}$ .